Memorandum 16 July 2008

To: David Anderson, Director, Audubon of Florida
From: John Ogden, Director of Bird Conservation, Audubon of Florida
Subject: Summary of Everglades Restoration Workshop II discussions

David – In response to several statements in the 2006 report of the National Research Council's Everglades Committee (CISRERP) that components of the greater Everglades ecosystem are continuing to change in undesirable ways, I invited a group of experienced Everglades scientists to a workshop to discuss the scope and characteristics of these changes in the context of the Everglades restoration programs. In other words, are we gaining or losing ground in our efforts to achieve our restoration goals? We held the workshop on the FAU campus on 24 June, hosted by Dr. Dale Gawlik. Participants and contributors (written comments) in these discussions were, Nick Aumen , Ronnie Best, Mark Cook, Mike Duever, Peter Frederick, Evelyn Gaiser , Dale Gawlik, Lorraine Heisler, Bob Johnson, Bill Loftus, Jerry Lorenz, Frank Mazzotti, Agnes McLean, Sue Newman, John Ogden, Mike Ross, David Rudnick, Ken Rutchey, Fred Sklar, and Tim Towles.

The two broad questions that framed the discussions were, (1) What are examples from the natural system that help to characterize the scope and magnitude of recent and on-going, undesirable changes (in the context of restoration goals) in the greater Everglades ecosystem, and (2) What are the risks of not reversing these changes in the near future (i.e., in the next few years)?

My take on the major messages coming out of these discussions is as follows:

I. There is broad agreement that the greater Everglades ecosystem under natural conditions was, (1) a much wetter, flowing system throughout the interior, freshwater regions, (2) much fresher in the estuaries, and (3) had much lower nutrient levels in the core Everglades (core = all of the remaining Everglades Protection Area, including ENP, all WCAs, and Holey Land/Rotenburger), than is the case with the current ecosystem. On-going ecological deterioration and change is occurring in <u>all</u> parts of the remaining natural wetlands because, overall, the current system is much too dry (except where impounded) and has lost sheet flow, much too saline in the estuaries, and has greatly elevated nutrient levels. For the most part the widespread ecological changes are not new, but have been occurring for decades **and are continuing to move the ecosystem away from its historical conditions.** For example, as early as 1993 (Science Sub-Group. Federal Objectives for the South Florida Restoration), conditions in Florida Bay were characterized as being "…indicative of acute ecosystem stress.). A Florida Bay ecologist who participated in the workshop last month affirmed the on-going nature of these changes ("northeastern Florida Bay has been radically changed…").

II. Due to on-going ecological change and degradation, delays in implementing Everglades restoration programs will increase the difficulty of recovering the essential defining characteristics of the historical Everglades, increase the probability of irreversible changes occurring, and reduce the number of options for recovering the Everglades and Florida Bay.

III. The existing science is more than adequate to guide the sequencing and design of an effective restoration strategy, using the principles of adaptive management to resolve unanswered questions.

Participants in the workshop focused the discussion on the changes that are occurring/have occurred in the core Everglades and southern estuaries, because of the importance of these regions for achieving the overall restoration goals of the Everglades ecosystem (as concluded by the 1st Restoration Workshop in September 2007). The participants of this 2nd workshop provided examples of undesirable ecological change in three regions of the Everglades/southern estuaries as a means of characterizing the nature and scope of these changes: (a) central/eastern Florida Bay; (b) the Everglades ridge and slough landscape; and (c) the southern, mainland mangrove ecotone that is the transition between the freshwater glades and the estuarine bays. The changes for each of these regions include the following examples:

01. East/Central Florida Bay:
    a. Salinity increases,
    b. Changes in sea grass (SAV) species composition and distribution,
    c. Loss of filter-feeding sponges in Florida Bay,
    d. Reduction of nesting spoonbills and crocodiles in northeastern Florida Bay,
    e. Reduced numbers of nesting Bald Eagles, Brown Pelicans, and other fauna.

02. Everglades Ridge and Slough:
    a. Loss of organic soils,
    b. Loss of tree islands,
    c. Expansion of enriched soils,
    d. Expansion of cattails and exotic plants,
    e. Loss of ridge and slough topography and community patterns,
    f. Degradation of wet prairie communities.

03. Southern Mangrove Ecotone:
    a. Structural deterioration of historical wading bird colony sites,
    b. Closure of most headwater creeks,
    c. Decline in fish production,
    d. Altered ecology of imbedded lakes,
    e. Inland expansion of saline wetlands.

Participants in the workshop discussed several related topics. My summary of these discussions is as follows.

"Irreversible" Ecological Changes: Some participants recognized that some undesirable ecological changes may become irreversible, or that they may require many 10s or 100s of years to be reversed. In general, the further down the path towards irreversibility that a change progresses, the more likely that passive restoration action will not work, and that hands-on management actions will be required. There are large uncertainties about the degree to which on-going changes have reached, or are approaching, irreversibility. Examples of possible irreversible changes may include some areas where dense mangroves have spread into former herbaceous estuarine communities, and where monocultures of cattails have replaced sawgrass and slough communities.

Climate Change: Some participants felt that a strongly compelling reason for accelerating the recovery of more natural flow volumes and hydrological patterns is that recovered flow patterns will buffer the system from the effects of sea level rise, and "buy time" for the natural system to adjust to shifts in the location of the freshwater/salt water "mixing zone".

Species Issues: Many participants felt that on-going declines in the population size of species of aquatic Everglades animals, including endangered species such as the snail kite and cape sable sparrow, are best countered by a successful ecosystem restoration program. It is unlikely that these species will ever be better off without a system-wide restoration program.

A Systems Approach: Some participants felt that a systems/landscape planning approach using the principles of adaptive management, including Incremental Adaptive Restoration (CISRERP 2006), may be the much more effective approach for determining the most ecologically beneficial distribution of limited water resources in the natural system, and for answering important scientific questions pertaining to ecosystem responses to alternative hydrological conditions.

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